Section 1-9 : Comparison Test for Improper Integrals

Use the Comparison Test to determine if the following integrals converge or diverge.

1. $\displaystyle \int_{4}^{\infty} \frac{1}{\sqrt[5]{z-2}}\,dz$

2. $\displaystyle \int_{0}^{\infty} \frac{w}{\sqrt{w^6+2}}\,dw$

3. $\displaystyle \int_{2}^{\infty} \frac{1}{(2w+3)^4}\,dw$

4. $\displaystyle \int_{12}^{\infty} \frac{y^2-4y+2}{y-7}\,dy$

5. $\displaystyle \int_{2}^{\infty} \frac{1}{\ln(x)}\,dx$ Hint : Sketch the graph of $y=x$ and $y=\ln(x)$ on the same axis system.

6. $\displaystyle \int_{2}^{\infty} \frac{\sqrt{z}-4\sin^2(z)}{z^3}\,dz$

7. $\displaystyle \int_{20}^{\infty} \frac{\sqrt[3]{2x}+\sin^2(x)}{\sqrt{x}-\cos^2(x)}\,dx$

8. $\displaystyle \int_{0}^{\infty} \frac{z\mathbf{e}^{-z}}{z^3+1}\,dz$